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## The MRE – A Lesson in Performance Nutrition

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You eat them when you're deployed or in training, and some people even claim to pick them up at the commissary for date night. They're your Meals, Ready-to-Eat™ (MRE™) ration, and deployed service members have been relying on them for more than 30 years. MRE™s have come a long way since they first made their debut. Since research and development of the MRE™ began in 1959, the MRE™ has improved significantly, mainly due to feedback on satisfaction from warfighters, but also because of technological innovation, and improved

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understanding of performance-oriented nutrition and operational mission performance demands.

MRE™’s Nutritional Standards Today

MRE™s today are designed to meet nutritional needs and satisfy our deployed warfighters’ food preferences. The main goal of the food technologists at the [Combat Feeding Directorate \(CFD\)](#), tasked with developing and continuously improving MRE™s, is to maximize warfighter performance. New MRE™s are chosen based on three primary factors. First is warfighter feedback and acceptance. If an MRE™ doesn’t get good feedback from service members, it gets cut. The CFD also uses feedback from service members to develop concepts for new flavors and food items.

The second factor is the nutritional content of those meals. All MRE™s need to meet the nutritional standards for operational rations, as determined by scientific evidence, and set forth by the U.S. Army surgeon general. The Nutrition Standards for Operational Rations (NSORs) include requirements for numerous macronutrients, vitamins, and minerals, which act together to maintain health and achieve optimal performance. Those standards are designed to meet the increased nutritional needs and sustain optimal performance of service members in operational environments, be it combat or combat training (read: this means they are not ideal for date night). Each MRE™ provides approximately 1300 calories, composed of approximately 170 g of carbohydrates, 45 g of protein, and 50 g of fat for the energy needed to accomplish any mission. This balance of nutrients is necessary to ensure all the complex systems of the body are functioning properly.

The third factor is the shelf stability. The CFD tests MRE™ production items to ensure the nutritional content and sensory quality don’t degrade too quickly, and continue to meet the performance-oriented nutrition needs of service members in the field over the entire shelf-life of the MRE™. The minimum shelf-life of an MRE™ is a whopping three years at 80 degrees Fahrenheit, and six months at 100 degrees Fahrenheit. This shelf-life ensures that service members serving in remote areas can not only feed their hunger, but also get the nutrition they need to sustain peak performance, even if logistics prevent regular delivery of rations. If an MRE™ prototype passes all three criteria, CFD then presents its recommendations to the Joint Services Operational Ration Forum, for their decision on whether to give the approval for the new items.

Leading-edge Technology

Meeting the three criteria of an MRE™ is no easy task and requires leading-edge technology. For example, in order to meet the required shelf-life the food and its nutrients are preserved through leading-edge food science processing and packaging methods. The keys to maintaining nutritionally optimal rations and food safety over extended periods of time are to limit the food’s exposure to light, oxygen, and moisture, all of which may deteriorate the food and its nutritional content. An example of these methods could be as simple as foil that creates a barrier to light and moisture. On the other hand, it could be as complex as a bakery item that includes an oxygen scavenger to minimize the impact oxygen might have on that bakery item, or a humectant which binds available water and keeps bakery products moist. Invariably, some degradation of the foods does occur over the shelf-life, but those degradations are taken into account to avoid nutritional deficiencies, maintain taste, and of course, maximize warfighter performance.

Improving the shelf-life of MRE™s is just one way food scientists at the CFD are using leading-edge technologies. CFD food scientists have been studying whether they can add performance-enhancing nutrition elements, like omega 3 fatty acids (a nutrient important for metabolism typically found in fish and some seed oils) into new MRE™s. The challenge with adding something like omega 3 fatty acids, is that over time you can get a fishy taste as the fatty acids in omega 3s break down. And no one wants to eat fishy chicken. However, the CFD scientists have figured out how to add it without that fishy taste! While this technology isn’t being used yet (pending review of NSOR requirements), it could be the future of MRE™s and

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## performance-oriented nutrition in the Services.

## Taking Performance-Oriented Nutrition into Your Own Hands

The CFD is also looking at ways to empower service members to take control of their nutritional needs, both at home and while deployed. They believe education is a key component of performance nutrition, and are currently striving to increase service members' awareness of the nutritional content of rations, and what service members actually need to consume to sustain peak-performance. One such way they are doing this is by collaborating with the DoD Nutrition Community and the U.S. Army Research Institute of Environmental Medicine (USARIEM), to update the nutrition education messages that accompany the MRE™s, and improve access to this information. In addition, CFD is collaborating with the Human Performance Resource Center (HPRC) to develop a website that will provide nutritional information at the component and menu level. The objective of the updates is to empower the warfighter to make appropriate performance-oriented nutrition choices. The nutrition education panels will soon focus on the role of nutrition to promote peak-performance and will also include nutritional needs information for when service members may be in extreme environments. These updated messages will be tested as early as the fall of this year.

In the meantime, you can learn more about performance-oriented nutrition, and how to sustain your peak-performance by visiting the following resources:

- NOFFS Nutrition page: [http://www.navyfitness.org/\\_uploads/docs/NOFFS\\_Nutrition.pdf](http://www.navyfitness.org/_uploads/docs/NOFFS_Nutrition.pdf)
- NMCPHC HPW Healthy Eating resources: <http://www.med.navy.mil/sites/nmcphc/health-promotion/healthy-eating/Pages/healthy-eating.aspx>
- NMCPHC HPW's Performance Nutrition page: <http://www.med.navy.mil/sites/nmcphc/health-promotion/healthy-eating/Pages/performance-nutrition.aspx>
- President's Council on Physical Fitness, Sports, and Nutrition: <http://fitness.gov/be-active/>

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